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The Changing Dynamics of Non-Primary Housing in New York City and its Implications on Housing and Planning Policy

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Abstract

Growth in the second home market has paralleled the emergence of an elite, mobile consumer class increasingly able to afford luxury goods. Development that emerges from these trends has been highly visible throughout the countryside and in coastal areas. Recently, however, the growth in demand for non-primary residences has reached cities. In New York City, increased demand for second homes is as likely to originate from abroad as it is from nearby suburbs. This shift is embedded within larger trends such as the profusion of transnational capital and the post-Fordist evolution of New York City.

This study critically examines the effects of the non-primary housing market on New York City's neighborhoods and residents through a mixed methods approach. Using spatial and regression analysis, the study analyzes the magnitude and distribution of non-primary housing along with its effects on housing prices. The findings of this research have important implications for housing affordability and for the residential character of New York City's neighborhoods. Policymakers should consider the market and human implications of these trends in order to design and create policy more effectively.

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Introduction

Considering the relative scarcity of land and housing in New York City, non-primary housing poses a salient set of policy challenges. Housing prices in New York City, for example, have become prohibitively expensive for many income groups. Not surprisingly, civic groups, advocates, and politicians perennially discuss housing affordability and local popular media devotes significant coverage to the latest housing trends and policy proposals. Recently, media coverage has examined the increased number of foreign nationals purchasing second homes (Barrionuevo 2012a). Outside of realtors with new clients, many residents are likely to question whether the public at large benefits from this new demand. Similar to suburbanites buying weekend apartments, these buyers often use properties neither as primary residential units nor as productive rental assets; these apartments are "non-primary units," residences that are not used as the owner's principle home where they usually reside.[1] Both local and foreign non-primary homebuyers have started exerting more influence on the residential real estate market in Core Manhattan (below 96th street). Although these units currently represent between three and four percent of total housing units in Manhattan, the numbers are growing (US Census Bureau 2010). The implications of the growing demand for non-primary housing should be addressed by examining how these units have affected housing prices and how part-time residency has affected neighborhoods.

Further research is required to better describe and quantify the possible utility or disutility to policymakers and residents alike. In doing so, policy recommendations can be formulated the accordingly mitigate the prevalence and effects of growing demand. This includes understanding at once the legal and policy frameworks as well as the larger trends that might be driving or facilitating the increased demand for non-primary housing. Therefore, it is important to consider these changes within the context of larger structural post-Fordist dynamics that have transformed real estate in global cities such as New York.

Over the 20th century, the city's economy has shifted from producing and trading physical goods, such as garments and ships, to producing intangible goods through the knowledge

[1] For tax purposes, the legal definition of primary, main, or principle residence varies from jurisdiction to jurisdiction both within the United States and in other countries.

economy. The emergence of the knowledge economy has spurred enormous economic growth, yet it has historically been concentrated in a limited number of lucrative sectors exerting tremendous impacts upon the city's economy. While delving into these transformative phenomena is beyond the scope of this paper, larger economic trends are important to understanding the socio-spatial dynamics of the housing market. Like in many large cities, the economic restructuring of New York City has led to higher demand and willingness to pay for housing within the center city where a changed urban landscape has become increasingly characterized by spaces of consumption as opposed to spaces of production.

This higher demand for living in Core Manhattan extends beyond current residents. Recently, wealthy foreign nationals have demonstrated an increasing interest in purchasing New York City apartments. For the super-rich, often referred to as "high net-worth individuals," non-primary homes are not outright investments but part of a more comprehensive wealth management strategy. Most do not buy these apartments for potentially high financial returns. In this sense, non-primary homes are consumption goods that, in addition to providing some potential financial upside, carry symbolic value for the expanding global elite.

Regardless of buyers' motives, the influence of the non-primary housing sector should not be ignored given its potential to perpetuate the affordability crisis and to intensify geographies of socio-spatial inequality in New York City. By gaining a clearer understanding of non-primary demand and its effects, advocates and policymakers can formulate normative claims for meeting broader housing goals to serve current and future residents' needs.

Background

The term non-primary residence is often used interchangeably or colloquially with terms such as "second-home," "vacation home," or "*pied-a-terre*." Each one of these has unique origins, evolving connotations and usage within different cultures. As examined within the next section, academic literature has at various points attempted to operationalize these phrases for conceptual and empirical purposes. Legal definitions of non-primary residence are not always stated outright within city, state, or federal statutes. One recent exception has been the

definition outlined by the 2008 Housing Assistance Act addressing exclusion of gain from income for primary homeowners in the Internal Revenue Service of the United States Code. Other applications, often within the context of rent-regulation law, are predicated upon some level of physical nexus between the occupant and the physical property on a case-by-case basis (Beyda 2009).

Since this thesis is most concerned with the tangible disutility associated with idle capacity, non-primary homes can be defined as "residential properties that owners use on a part-time basis for less than the majority of the calendar year." The definition is similar to the one used by the United States Census Bureau. The bureau calls these residences "seasonal, recreational, or occasional use" units and categorizes them as a subset of vacant units. The definition for the category is "…units used or intended for use only in certain seasons or for weekends or other occasional use throughout the year…" (2010 Census SF1: Census of Population and Housing Technical Documentation 2012, B–22). It also includes shared-ownership properties, a relatively new concept with a currently negligible share of the non-primary residence market in New York City (Stoler 2009).

Although the Census Bureau started keeping track of these units in the 20th century, non-primary residences in the city are not entirely a modern phenomenon. The affluent class in the 18th and 19th century often owned summer estates. Examples in New York City include the Morris-Jumel Mansion in Harlem as well as Gracie Mansion in Yorkville. These homes, built in what was then the non-urbanized periphery of New York City, served a similar function to traditional, seasonal rural and coastal second homes used for vacation and leisure. The mansions however, bear little resemblance either in style or in size to today's non-primary residences in New York City. Today's residences are often referred to as *pied-a-terres*, a term popularized back in the 1950s when suburbanization increased commuting distances. Affluent, white-collar suburbanites sought these small apartments for convenience when work went late, or for more clandestine personal uses.

Although some non-primary homes are located in the outer boroughs, the vast majority of these units are located in Manhattan where housing prices are highest. Not surprisingly, this overlap

has brought attention and concern to the possibility that non-primary units might be driving up housing prices. Demand for non-primary apartments is but one of many factors thought to be pushing up housing prices in New York City. Many reference claims that regulation, such as zoning, is driving up housing supply costs (Glaeser, Gyourko, and Saks 2005). Housing advocates, however, more commonly emphasize the need for more regulated affordable housing units as opposed to pushing for new (market-rate) construction. A count of non-primary units in Manhattan from the previous five decennial censuses shows that non-primary units have historically accounted for a small but growing share of total units (including non-market rate units).[2]

Table 1: Non-Primary Units in Manhattan 1970-2010

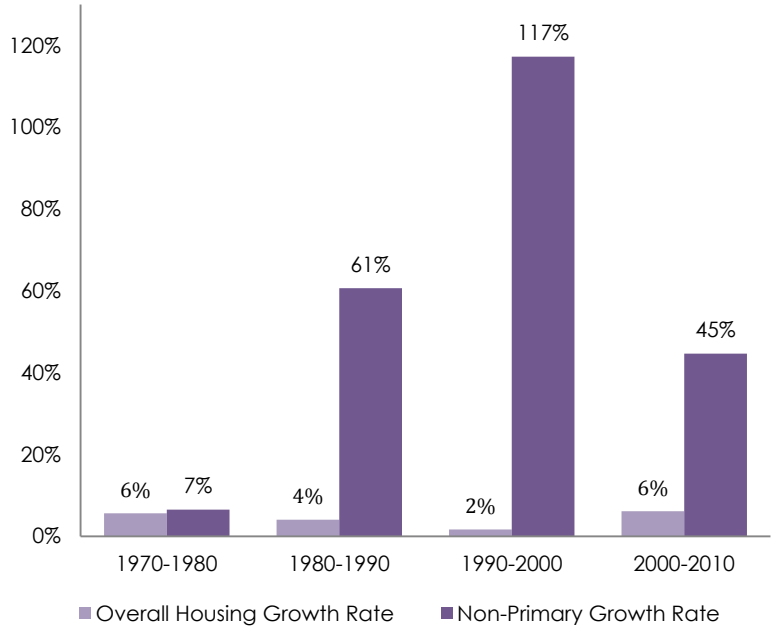
Year	Non-Primary	Total Units	Percentage of Occasional/Total
1970	5,239	714,371	0.73%
1980	5,581	754,416	0.74%
1990	8,967	785,127	1.14%
2000	19,481	798,144	2.44%
2010	28,184	847,090	3.33%

Source: US Census Bureau Decennial Census 1970, '80, '90, 2000 and 2010

While the share of housing units used as non-primary residences is still small, there has been nearly a fifty percent increase in units in the past ten years alone. A comparison of the growth rate of non-primary units versus the growth rate of total units shown in Figure 1 and Table 2 are noteworthy.

[2] Starting in 1980, the Census Bureau began to distinguish between migratory use and seasonal, recreational, and occasional use. In Manhattan, however, migratory use has historically been marginal.

Figure 1: Manhattan Growth Rates of Non-Primary Housing and Total Housing 1970-2010



Source: US Census Bureau Decennial Census 1970, '80, '90, 2000 and 2010

Table 2: Gain in Non-Primary Units as Share of Gain in Total Units

Year	Net Gain in Non-Primary	Net Gain in Total Units	Gain in Non-Primary as % of Total Net Gain
1970-1980	342	40,045	0.85%
1980-1990	3,386	30,711	11.03%
1990-2000	10,514	13,017	80.77%
2000-2010	8,703	48,946	17.78%
1970-2010	22,945	132,719	17.29%

Source: US Census Bureau Decennial Census 1970, '80, '90, 2000 and 2010

These numbers indicate that the growth rate of non-primary housing is multiple times that of overall housing. A large percentage of the net-gain in units is also being absorbed or negated by units used as non-primary residences, which complicates simple supply side affordability arguments. While new construction slowed down significantly in 1990-2000, demand for non-primary units did not. In essence, demand for non-primary residences has far outpaced new supply of housing for the past forty years. Whether or not this has had an impact on housing prices will be examined in the following sections.

Given these trends, to what extent is increased demand in non-primary units tempering the potential of new residential construction to address housing affordability? New York City's

Mayor Bloomberg has promoted new residential construction as part of the solution towards affordability since 2002. Whether because of New York City's rapid economic growth or active policy decisions, the mayor's approach to development has pleased many different interest groups that advocate for less regulation and a "friendlier" development climate. Despite the climate conducive to residential development, New York City's affordability crisis continues. In the same year that housing stock levels reached a record high, New Yorkers had the largest average *gross* rent-income ratio (rent burden) in the United States, approximately 34%. As a reference point, the optimal rent burden is customarily thought to be no higher than 30% (Census Bureau 2011).

Traditionally, government and researchers have used rent burden to analyze affordability. The metric is calculated by dividing household expenditures on housing over total income. Using this measure, a recent study by the Office of the City Comptroller estimated that 49% of New York City and households incur a rental burden of more than 30% (Liu 2012).[3] Fine-tuning these findings and comparing them to other reports indicates the threat affordability poses to tempering the uneven socio-economic geography of New York City.

Furthermore, the MIT Center for Real Estate Housing Affordability Initiative, among many others, have noted that the rent burden statistic obscures hidden benefits and costs of housing location choice such as mobility, school districts, crime, and other variables. Thus, the importance of housing and income geographies are heightened by their impact on opportunity. GIS analysis demonstrates this spatial disparity and correlation of income and rent-regulated apartments across NYC. The strong periphery/center patterns show that Manhattan below 96th street (Core Manhattan) and parts of northwestern Brooklyn are very affluent in comparison to the rest of the city.

City housing policy has attempted to partially address housing disparities through a set of policies, most notably within the controversial 421-a tax abatement program that was amended in 2008 to require *on-site* affordable housing in exchange for tax exemptions for building in vacant and under-utilized lots. A variety of other housing programs in NYC also provide

[3] Since more than 65% of New York City lives in rental units, most studies exclusively focus on rents.

affordable housing units within Core Manhattan, such as units covered by rent stabilization laws.[4] Rent-stabilized units account for almost half of the rental stock but are concentrated above 96th Street. However, they generally become deregulated once they reach $2,500 a month or when the tenant's income surpasses $200,000. Moreover, the median income of rent-stabilized apartment households in Core Manhattan was $57,760 in 2011, compared to $110,000 in market rentals, while the median rents were $1,480 and $2,725 respectively. The median household in both types of unit share about the same rent burden (Furman 2012). These numbers conform to the City Comptroller's report that highlights the housing affordability crisis facing middle income families (Liu 2012, 7).

In addition to increasing demand, the prevalence of non-primary housing also changes the type of housing units built. Most non-primary homebuyers look for smaller apartments with amenities such as doormen that better meet their needs. A recent report indicates that the increase in average price per square foot for one bedroom apartments has increased at approximately twice the rate of the overall market (Miller 2013). Furthermore, developers might increasingly be catering towards the non-primary homebuyers market by providing amenities in new luxury condominiums more akin to hotels than to apartment buildings.

Lastly, non-primary residences could affect the character of the immediate neighborhood or vicinity if they become an increasing share of the area's housing stock. More businesses might cater towards the needs of part-time residents while specialized services requiring a year-round critical mass, like shoe repair stores or daycare centers, might dwindle. At its most extreme, the variable density effects could mean less lively streets and activity that often draws people to cities. In coastal and rural areas, as the next section discusses, there are immediate consequences for the character of small jurisdictions. Within the urban context, further investigation helps clarify how the different dynamics might or might not be causing observable changes.

[4] For a complete overview of current affordable housing subsidy programs, see Begley et al. 2011 and NYC HPD 2013.

Second Homes and Planning Theory

Over the past five years, numerous newspapers and publications have addressed the different issues relating to the increase of second homes in cities (Barrionuevo 2012a; O'Sullivan 2012; McMullen 2007; Grabar 2012; Wong, Saminather, and Yu 2011). Despite the widespread attention in popular media, urban non-primary housing has scarcely been addressed in academic literature. Owing to the varied nature of non-primary homes, the topic has been explored within diverse research disciplines such as tourism studies, urban planning, and housing studies. While not directly addressing the topic, many themes within the social sciences intersect with the emerging trend of urban second homes. Issues of transnationalism, globalization, mobility, and the changing culture of cities are encompassed within discussions on second-homes.

Ultimately, this thesis examines the effects of non-primary housing in Manhattan on housing affordability and neighborhood character. In addressing these issues, relevant theoretical considerations are important to conceptualizing and contextualizing the phenomenon within a collection of transformative processes central to urban planning and theory. Doing so informs our understanding of the complicated web of forces driving non-primary housing in New York City. First though, urban non-primary homes are considered vis-à-vis previous, more traditional literature on the subject.

Traditional Geographies of Second Homes

Despite the emergence of non-primary homes in cities such as London, Hong Kong and Paris (Fernholz 2012; Grabar 2012), the second-home market in the United States and Europe is still dominated by coastal and countryside homes. As consumption goods, these homes provide buyers with recreational, leisure, and relaxation opportunities. According to Módenes and López-Colás' (2007) analysis of second-home buyers, the attraction to second homes follows the logic of the compensation hypothesis; as a consumption good, second-homes provide forms of utility such as proximity to nature that are otherwise unavailable to city dwellers. This has historically driven the market for second homes in coastal and rural areas such as South Florida and the British countryside.

Regardless of their location, non-primary homes present challenges to the fabric of local communities. The effects of second homes on communities have been outlined in case studies dating back to the 1970s (see Hoogendoorn 2004; Clout 1971 among others). In the United Kingdom and the United States, the classification of second-homes as a separate category only began to take place in the mid-20th century. Clout's early case study notes that a lack of understanding of these effects can partially be attributed to the dearth of statistics on second homes in some countries (ibid, p. 531). Researchers in the UK were among the first to examine these effects in a more critical and detailed fashion, thus formulating a framework through which to examine the costs and benefits of second-home growth in rural regions. Shucksmith (1983), for example, focused primarily on how the potential to inject money into declining rural economies is often weighed against growing housing costs and unwanted changes in neighborhood and community character.

These studies suggest some guidelines as to how planning might broadly address second homes, but the localized focus is often of limited usefulness in both analyzing issues and making recommendations for planning within the urban context of contemporary global cities. For example, the regulatory land-use solutions proposed by Gallent (2001) are thoughtful strategies for sustaining rural character but are ineffectual at addressing urban housing affordability issues. The existing literature on second homes in rural areas has provided a solid foundation from which to build upon, but the localization of the phenomenon is indicative of the lack of scholarship conceptualizing second-homes at a macro-level that could more broadly guide case studies and policy recommendations more widely.

Tourism

Foundationally, "critical tourism studies" could be considered naturally positioned to provide a framework for studying non-primary homes within the broader economic, cultural and political context. Up until Hall and Muller's (2004) anthology of essays on the topic, both the evolving nature of non-primary housing and the confusion around the term itself contributed to the anemic critical emphasis on the topic. Erik Cohen's seminal work, which laid a foundation for the field of critical tourism, fleetingly refers to non-primary housing in his article "Who is a Tourist: A Conceptual Clarification" (1974). Cohen points to the intermediary nature of non-primary homes:

> The *summer-house owner* possesses a second home at some distance from his regular abode, where he and particularly his family spend prolonged yearly vacations and which they might also frequent for shorter periods during the rest of the year. Since recurrency of visits here is fairly high, the 'touristic component' of the visits is relatively small. This is a type of marginal tourist, ***intermediate between fully fledged tourism and residency*** [emphasis added].
>
> The *week-end house owner* [author's emphasis] possesses a second home near enough to his regular abode for it to be accessible during week-ends. Visits are very frequent so that their 'touristic component' is much reduced; this is at most a case of minimal tourism. (p. 540)

More recent work on tourism builds on this basic characterization and towards a critical conceptualization of second home tourism within the social sciences (Hall and Müller 2004). Even before Muller and Hall's work, tourism scholars were already exploring the meanings and themes of second-home tourism, many of which overlap with broader critiques of tourism (Jaakson 1986). Returning to Cohen's characterization of non-primary housing, the recurring nature of visits still provides a definitional basis for many scholars as well as legal practices evidenced throughout a variety of tax codes (Wedemeyer 1984). Urban non-primary apartments, however, demonstrate key differences from traditional second homes in respect to central themes such as usage, identity, consumption, etc. For example, an apartment in Manhattan might be used for business trips, for leisure, and/or for housing children temporarily enrolled in local universities. Such characteristics complicate urban second homes' place within critical tourism studies and its ability to provide context for planning and policy.

While not directly addressing second homes, tourism studies literature has also contributed to the understanding of what draws visitors to cities. Recent studies have used quantitative analysis to make a direct connection between foreign real estate investment in certain countries and the countries' general success in drawing tourists (Rodríguez and Bustillo 2010; Fereidouni and Masron 2011). The connection between tourism and real estate reveals an important underlying attraction for many buyers of second homes in popular tourist cities that lack beach or other natural amenities.

In the 1990s, a new distinct focus in tourism emerged focusing on cities. This focus materialized in response to two trends: (1) an increase in the number of tourist visits, and (2) cities' growing interest in using tourism strategically as part of broader efforts to revitalize city centers (Pearce 2001). This emerging interest also ran parallel to urban studies' growing academic literature at the time on the revitalization and gentrification of urban spaces, spurred by the post-Fordist transformation of American and European cities. During this period, the term "Disneyfication" came into vogue within urban studies literature, appearing often in studies critically examining projects from the "cleaning up" of Times Square in New York City, to the renovation of Faneuil Hall in Boston (see Zukin 1995, among others). As Pearce notes, tourism studies, as an academic field, often struggles to disentangle its subject of study from other urban functions (2001, p. 929). However, the rise of tourism in New York and other cities is intertwined with larger transformations to the job market, city economy, and land property values.

Today, tourism in New York City is an increasingly vital component of the economy proactively promoted by city policy. In a service economy, the spending habits of tourists employ many New Yorkers in one form or another (NYC Statistics 2012). Mullins describes this focus on tourism economic development as a component within what he terms "tourism urbanization" (1991, 326). This type of urbanism is driven by "…consumption for fun, pleasure, relaxation, recreation, etc.…(as opposed to) a consumption of basic needs in the way of housing, health care, education and so on" that traditionally shape urban neighborhoods, according to residents' needs (ibid.). Non-primary homes as an extension of tourism urbanization can similarly be theorized as to their possible effects on neighborhood transformation.

Additionally, tourism provides concrete examples for understanding the spatial dimensions of local-global relations as manifested within the effects of increased tourism on cities. In a recent case, local residents originally proposed the High Line Park in New York City through bottom-up efforts, but its growing popularity and the throngs of tourists have changed the surrounding neighborhoods. New development has also mirrored the growth of non-primary residences in the area. This narrative is common in city neighborhoods wherein local processes driven by

local actors and stakeholders aim to create an amenity that is transformed and shaped along the way by top-down demands on large cities facing pressure to maintain global competitiveness in all fields, including tourism. Using this bottom-up and top-down interaction, Chang et al. (1996) illustrates how different scales and forms of agency are often intertwined; local actors strongly influence a decision-making process that is often guided by private interests and loosely controlled by public or quasi-public agencies. His case studies of urban heritage tourism in Montreal and Singapore illustrate how this dynamic shapes urban form (Chang et al. 1996). Synthesizing this literature on urban and critical tourism with existing literature on second homes provides a new path towards understanding how different phenomenon associated with non-primary homes can be conceptualized outside of bounded localized processes.

Transnational Dimensions of Non-Primary Urban Homes

Within the fifty years, increased mobility spurred by technological changes has played an important role in the geography and evolution of non-primary homes. While Jackson (1986) and others understood second homes primarily as a domestic phenomenon, cheaper and more frequent flights have added a transnational dimension to the market for non-primary homes. Consequently, some non-primary homebuyers gravitate towards buying in lower-cost countries easily accessible by airplane within a time period of less than a certain amount of hours. The rise of the global elite, however, has stimulated capital to flow both ways with many non-primary homebuyers from less economically developed countries purchasing real estate in wealthier countries. A recent report shows a rapidly growing number of residential real estate buyers from "BRIC" countries (Brazil, Russia, India, and China) joining traditional buyers from the UK and Canada in purchasing properties across the United States (National Association of Realtors 2012).

The globalization of residential housing as an asset is a newer phenomenon that has already had serious economic consequences for countries like Spain. Housing speculation drove many Spanish firms to develop second homes for both domestic and international buyers. In turn, overbuilt rural and coastal areas have significantly contributed to the liquidity crisis due to the sudden contraction of local and global demand for luxury goods during the Great Recession that started in 2008. More broadly, the changing geographies of housing asset accumulation

have contributed to the uneven "spatial impacts of wealth distribution within cities, regions, and globally" (Forrest 2008, 173). This has created a class of what Forrest calls the housing-asset rich, including non-primary homeowners, whether local or international. While the classic *pied-a-terre* owned by suburbanites still accounts for a significant amount of the New York City's non-primary housing stock, the growing transnational flows add a new dimension to policy considerations as this demand further contributes to competition for residential properties in desirable areas (ibid, 175).

Aside from affordability, the social and cultural dimension of non-primary housing poses a challenge to local neighborhoods. In more abstract terms, novel flows of people whom are neither residents nor tourists challenges notions of place, belonging, and identity, which are all important themes of transnationalism. As a nascent field, transnationalism is often described in terms of intensity and recurrence of activities that take place across borders (Portes 1999), and/or in terms of identity formation (Schiller, Basch, and Blanc 1995). Schiller further qualifies transnationalism by questioning the degree to which subjects "become incorporated in the economy and political institutions, localities, and patterns of daily life" (1995, 48). Scholars like Manuel Castells and Doreen Massey have emphasized the effects of globalization on notions of place that are no longer bounded, instead characterizing them as relational, dynamic spaces of flows. However, as Antonsich (2011) notes, people still carry their daily lives within physically bounded spaces that remain relevant to political and social identity. Gallent (2007, 97) examines some of these themes in relation to second homes by posing "questions of what it means to 'dwell'," and how these questions are connected to notions of place-based identity, and community. These themes are directly related to the place effects of non-primary homes on local communities and neighborhoods. As such, both economic and social components of non-primary homes run parallel to and are intertwined with other global-local phenomenon that are described by Brenner (1998a, 3) as a "highly contradictory reconfiguration of densely interwoven, superimposed spatial scales."

Despite the rich urban theory literature addressing relevant issues and themes of second homes, the emerging trend of urban non-primary homes has received little theoretical or practical consideration. One exception has been Chris Paris' (2009) appeal to re-position the topic

within the discourse of gentrification and neighborhood change. In that vein, this study on non-primary homes in New York City addresses the significance of non-primary homes within broader theoretical considerations while also providing an empirical analysis in NYC.

Research Design

Research for this study utilizes a mix of methods to: (1) identify and quantify the phenomenon; (2) gain insight into local conditions and global systems that are driving current trends; and (3) synthesize and process quantitative and qualitative data to better understand the implications of these trends. The research was conducted in roughly three phases mirroring these goals. Interviews, research, spatial analysis, and regression analysis all complement each other to produce a holistic and comprehensive understanding of the phenomenon.

Phase One

News Articles and the Public

In addition to reviewing market reports, housing policy plans, and affordable housing programs in New York City, I collected newspaper and magazine articles on second homes. These articles, mostly lifestyle stories from local newspapers, were treated as interpretations of a trend that shape public discussions regardless of their factual basis. The articles offered insight into the public discourse, in so much as one exists, surrounding second homes. These accounts of building residents, second homebuyers, and brokers were instrumental given the lack of resources and time needed to conduct a more extensive set of interviews.

Spatial and Temporal Parameters

Data was collected from the past five decennial censuses to outline the overall trend and map the distribution of second-homes in New York City for the years of 2000 and 2010. Table H5 within Summary File 1 of the decennial census lists “for seasonal, recreational, or occasional use” as one of seven vacancy types (US Census Bureau 2000; US Census Bureau 2010). I decided to use the smallest geographic level of aggregated data, the census block, as opposed to larger geographic levels of aggregated data at the tract level. This decision prioritized spatial

detail over temporal detail that the American Community Survey provides. In addition to providing more spatial detail, census block areal units are potentially more meaningful spatial units of aggregations since the vast majority of these census blocks coincide with individual city blocks.

While second homes exist in other areas of New York City, the study area was limited to New York County (Manhattan) in order differentiate between urban second homes and second homes in coastal areas like Far Rockaway, Queens and Pelham Bay, Bronx. Additionally, the study is focused on recent changes and the intensification of the phenomenon as opposed to a historical account of non-primary housing. Thus, the spatial and quantitative analysis was limited to looking at the two most recent decennial censuses (2000, 2010).

Preparing Census Data for Comparison

With these initial spatial and temporal parameters in place, I mapped the geography of non-primary homes at the census tract level and the block level using Esri's ArcGIS software. The 2010 and 2000 geographical boundaries do not coincide and therefore were reconciled into the same areal unit in order to quantify the changes in non-primary housing and the changes in total housing units within the ten-year period. The relationship between the aggregation boundaries in 2000 and 2010 fall into the following categories: (1) one-to-one relationships; (2a) coterminous one-to-many relationships; (2b) non-coterminous one-to-many relationships; (3a) coterminous many-to-one relationships; (3b) non-coterminous many-to-one relationships; and (4) many-to-many non-coterminous relationships. Based on these types of relationships, 2010 data, which contains more geographical units, was bridged to 2000 geographies in order to minimize data manipulation (i.e. the interpolation of non-coterminous areal units needed to reconcile the boundaries).

For census tract geographies, I bridged the data using a separate data file and executing a computational code developed for Stata software by researchers from various institutions (Stults).[5] I also bridged census block data to 2000 geographies using areal interpolation methods on ESRI's ArcGIS. The percentage of units allocated to 2000 census blocks units were

[5] See http://www.s4.brown.edu/us2010/Researcher/BoundaryAdjustments.htm for a full description on boundary adjustment methods based on area and population interpolation.

based on the percentage of the 2010 areal unit contained within the 2000 census block unit. This method assumes homogenous distributions of units within blocks leading to potential errors; a block containing a high-rise apartment building on one corner and townhouses throughout, for example, would not be accurately allocated. In sum, however, the large number of census blocks and the large percentage of coterminous one-to-many relationships and one-to-one relationships outweigh the potentially erroneous results of bridging other types of boundary relationships. Most importantly, these methods provide a simple and replicable way to analyze the changes from 2000 to 2010 in detailed form.

Phase Two

Document Review

I first analyzed real estate and housing to provide further context before proceeding to interviews and quantitative analysis. This review included reports prepared by public agencies, research institutions, and real estate agencies. The materials range from reports on rent-stabilized apartments to condo and co-op quarterly sales trends published by brokerage companies. The reports informed a broader understanding of the New York City housing market, a necessary step towards designing appropriate interview questions and constructing quantitative models that fit my research questions.

Interviews

I conducted six interviews over the months of February and March, 2013. The semi-structured interviews each lasted between thirty minutes to sixty minutes and included second homebuyers, one planning official, and real estate and financial professionals. The subjects were granted anonymity and are referred to by their respective professions. This was done for various reasons: (1) to allow subjects to disclose financial details they would otherwise be hesitant to discuss; (2) to ensure that client confidentiality is not compromised; and (3) to allow officials from public agencies to speak freely without compromising their positions or misrepresenting the agencies' views. The interviews allowed for a more in-depth exploration of the motives and preferences of second homebuyers, how the market operates, and to gauge

local government agencies' awareness of the trend. The interviews were not designed as a survey of second homebuyers, professionals, and officials, but as a means to reveal nuances that might not otherwise be captured by other research methods.

Phase Three

Spatial Analysis

The aggregated census data previously discussed was visualized using Esri's ArcGIS software. As part of the initial analysis in phase one, the number and share of non-primary over total units in Manhattan were mapped at the block level. Additionally, the boundary adjusted census data was also used to calculate the following changes within each tract: (1) the change in total units; (2) the change in non-primary units; and (3) the change in share of non-primary units over total units. Cluster analysis at the block level for the following variables was conducted on ArcGIS for the following variables:

- 2000 number of non-primary units
- 2000 percentage of non-primary units over total units
- 2010 number of non-primary units
- 2010 percentage of non-primary units over total units

For each of these variables, I utilized both Anselin Local Moran's I statistic and Getis-Ord Gi to calculate and visualize clustering of high values and low values of the variables above. Additionally, two conceptualizations of space were used to search and compute the neighbors for each census block: an inverse distance weighted method and a fixed radius method. The inverse weighted method was used with a distance band of 7,500 feet measured in Manhattan distance (90 degree angles). The fixed method was used with a distance band of 2,500 feet also measured in Manhattan distance. ArcGIS calculates these distances using the centroid of the census block as a reference point. While Anselin Local Moran's I measures clustering by only considering the values of neighboring census blocks, the value of the reference census block, which is used to determine its neighbors, is not included in the calculations. Getis-Ord Gi, on the other hand, utilizes the value of the reference block in addition to the values of its

neighbors.[6] In essence, each statistic calculated used either all census blocks within half-a-mile or a weighted version of all census blocks within one and a half miles wherein closer blocks are considered more important than more far away blocks.

Using these variations of clustering produced a set of twenty maps to analyze. These various parameters and conceptualizations of space were used because neighborhood boundaries and proximity are social constructs, not given values. Therefore, the places and forms in which non-primary housing clusters are better understood through examining them at two different spatial scales (roughly 4-6 city blocks versus 15-20 city blocks) and introducing weights based on proximity.

Regression Analysis and Other Data

I used Regression analysis to examine the effects of non-primary demand on housing prices in Manhattan. Data for this analysis was collected from three different sources: the decennial census, the Department of City Planning, and Win2Data property database (CoreLogic 2012; NYC Department of City Planning 2011; US Census Bureau 2000; US Census Bureau 2010). Respectively, these provided information on non-primary units, sales transactions, and property characteristics. Additionally, I used the NYC DOF property address directory to join and georeference sales transactions to tax lots (NYC Department of Finance 2013).

Table 3: Description of Data Sources

Data Source	Scale of Analysis	Time Period	Reliability	Source
Decennial Census	Census Block (City Block)	2000-2010	High	US Government
Win2Data	Individual Unit	2008-2013	Medium	CoreLogic (Private Company)
MapPluto	Tax Lot	2011	Medium	NYC Department of City Planning

Variables collected from these sources are listed below:

Census

- Non-Primary Units
- Total Units

[6] For a more detailed explanation and mathematical equations see Mitchell, 2005.

- Percentage Black
- Percentage Latino or Hispanic of any race
- Percentage of Owner Occupied Units

Win2Data

- Sales Price
- Square Feet of Unit
- Owner
- Owner Mailing Address
- Unit Borough Block Lot Number (BBL)
- Sales Date
- Taxable Value
- Exempt Taxable Value

MapPluto

- Year Built
- Number of Stories
- Year Altered
- Lot Dimensions
- Building Class (e.g. walk-up versus elevator)
- Historic District Designation
- Types of Uses (Commercial, Residential, and Retail)
- Total Residential Units Within Tax Lot
- Tax BBL Number

These datasets present challenges caused by the incongruities among spatial units of analysis and the observation time periods. The data is organized at three spatial scales, wherein in each sales transaction is associated with building characteristics and census block characteristics. While there were approximately twenty six thousand sales transactions, they were all contained within 1,119 buildings, which were located in 784 census blocks in Manhattan. Additionally, sales transactions were collected from the five years centered on the last decennial census (2008-2012). The data was collected in November 2012, and therefore did not include sales from November and December 2012. The difference between the share of non-primary units in 2010 and 2000 served as a proxy for the increase in demand of non-primary housing with the implicit assumption that these changes have been approximately linear. In some instances, the MapPluto data, published in late 2011, lacked information on the newest buildings. Further limitations and assumptions are discussed within the description of the model.

Data Availability and Cleaning

The sales transaction data was collected and compiled by CoreLogic, a private firm catering primarily realtors looking at sales comparison analysis. Most of the data is entered into the database by realtors and is updated on a monthly basis. Data entry errors were quite common, many of which were accounted for during in cleaning and preparing of the sales price data for processing. While the New York City Department of Finance also maintains a sales database, they do not contain the square footage of each of the unit sold and the database is not limited to arms-length transactions. Both databases lack reliable and consistent information on the number of rooms and amenities such as doormen. More data on building amenities would make the analysis more robust by accounting for important characteristics that might explain some of the variation in prices among buildings.

In order to account for the varying size of apartment units, I calculated price per square foot for each sales transaction observation. This limited the available data to only condominium units because square footage is not recorded for co-op sales (Schill, Voicu, and Miller 2007).[7] Furthermore, market rental prices are not accessible in a comprehensive tabulated format. The analysis on affordability assumes that market rental prices and market sale prices move in tandem as they are all part of the market for a bundled consumption good, housing.

Lastly, the following condo sales observations were omitted because they were assumed to be entry errors:

- Any observation with unit smaller than 200 SQFT
- Any observation with unit larger than 15000 SQFT
- Any observation that sold for more than $13,048 per square foot (the known record price in NYC for condo sale)
- Any observation that sold for less than $100 PSF

[7]Co-ops are not legally bound to report square footage since the purchaser is not outright acquiring real property, but a share of a building's ownership. As Schill et. al note, condos generally carry a small premium but co-ops can also have an exclusivity factor, particularly in highly sought buildings. This is because purchasers need to meet more stringent and at times arbitrary requirements of the specific co-op board. These requirements, as noted in the discussion section, also steer most non-primary homebuyers towards purchasing condos.

- Any observation that was assumed to be part of a bulk sale (three or more units in same building sold on same date at same sale price)[8]

Regression Analysis

To analyze whether the increase in share of non-primary housing can help explain the variation among sales prices in Manhattan, the difference in share of non-primary units associated with each building was introduced into a linear hedonic regression model that accounts for physical and neighborhood attributes. At its core, a hedonic model expresses price as a function of numerous characteristics (Rosen 1974) :

Equation 1: $p(z) = p(z1, z2, \ldots, zn)$

These characteristics are usually physical (e.g. condition, age, size, etc.) or non-physical, such as neighborhood schools and air quality. Each contains an implicit price function. The model proposed in this study builds upon this hedonic model by introducing the change in share of non-primary housing as an explanatory variable for housing price variation. Using the share of non-primary housing only in 2010 was also considered, but this would lead to issues of endogeneity most likely caused by the omission of variables and/or reverse causality (the percent of non-primary homes being a function of the price). The model used can be expressed as:

Equation 2: $Y = \beta 0 + \beta 1X1 + \beta 2X2 + \beta \ldots nX \ldots n + \varepsilon$

Wherein Y, the dependent variable, represents price per square foot; β the constant for each independent variable (wherein β_0 represents the constant for the equation); X_1 represents the observed change in the share of non-primary homes associated with a unit; $X_{2\text{-}n}$ represents a series of housing characteristics similar to the z term in equation 1; and ε represents the error term.

[8] These sales were recorded by unit but only with total price of the bulk transaction listed for each individual unit.

The variables used within the regression and any transformations are listed in the Table 4 below.

Table 4: Description of Variables Utilized for Regression Analysis

Variable	Transformation Note	Type (Original)	Source	Notes
Price Per Square Foot	Log Transformation	Continuous	Win2Data	Dependent Variable
Square Feet	NA	Continuous	Win2Data	
Year Sold	NA	Categorical	Win2Data	Reference Year = 2008
Month Sold	Grouped By Quarter	Categorical	Win2Data	Reference = Jan. - Mar.
Year Built	Categorical	Discrete (Year)	MapPluto	Pre-1945 (reference); Post-War (1945-1997); New (1998-present)
Altered	Binary	Discrete (Year)	MapPluto	Building Structurally Altered in the Past 35 years = 1
Historical District	Binary	Categorical	MapPluto	In Historical District = 1
Mixed Use	Binary	Continuous	MapPluto	If Tax Lot Contains any Non-Residential = 1
Storage	Binary	Continuous	MapPluto	If tax lot contains any storage = 1
Difference in Share of Non-Primary Units (2010-2000)	NA	Continuous	Census	Calculated Using Non-Primary Units / Total Units in Census Block
% Latino	NA	Continuous	Census	Block Level
% Black	NA	Continuous	Census	"
% of Units Owner Occupied	NA	Continuous	Census	"
Building Class	Dummy	Categorical	MapPluto	Elevator = 1
Neighborhood	NA	Categorical	Department City Planning	Reference = Battery Park City; See Appendix for Map Neighborhoods and Codes
Stories	Categorical	Discrete	MapPluto	Up to 7→Low-Rise (reference); Up to 15→ Mid-Rise; 15 and up→High-Rise

A common criticism of hedonic regressions is that the model does not account for spatial dependence and heterogeneity (Can 1992). Using geographic submarkets is one basic way to account for heterogeneity and, to a lesser extent, autocorrelation (Bourassa, Cantoni, and Hoesli 2007). The model in this study uses neighborhood submarkets. These submarkets were designated by joining the georeferenced sales with neighborhood tabulation areas created by the NYC Department of City Planning for population projections (NYC Department of City Planning 2013; See Appendix for Map of Neighborhoods). The results of this regression are discussed in the next section.

Findings and Results

Summary

Between 2000 and 2010 there was an increase in the share of non-primary housing throughout most of Manhattan. In 2000, most census blocks containing a large share of non-primary housing were along the southern half of Central Park. By 2010, the share of non-primary housing intensified in and around these areas. Additionally, the share of non-primary housing grew noticeably in areas below 57th Street. The volume of condo sales transactions between 2008 and 2012 is greater in areas where the share of non-primary units increased. The regression analysis of sales transactions indicates that, controlling for all other variables, *sales within areas that have experienced an increase in the share of non-primary units had a small positive effect on price per square foot*. This coefficient and the model presented are statistically significant at a 99% confidence level.

Spatial Analysis

In both 2000 and 2010, non-primary units were found throughout almost all areas below 110th street on the West Side and below 96th Street on the East Side (see Figure 2). The concentration of non-primary units over total units (share of non-primary units) is highest adjacent to Central Park below 86th Street. In many of these census blocks, nearly half or more of the total housing units are second homes. As for changes in spatial patterns within the ten-year period, the share of non-primary units intensified and spread around many of the areas where non-primary units already accounted for a large percentage of total units in 2000 (see Figure 3). Furthermore, high shares of non-primary units spread below 57th Street with the exception of the East Village. Higher percentage non-primary census blocks are more numerous and pronounced in areas such as the Upper West Side, West Village, Flatiron, Union Square, and Tribeca.

Figure 2: Comparison of 2000 and 2010 Number of Non-Primary Units per Census Block Manhattan

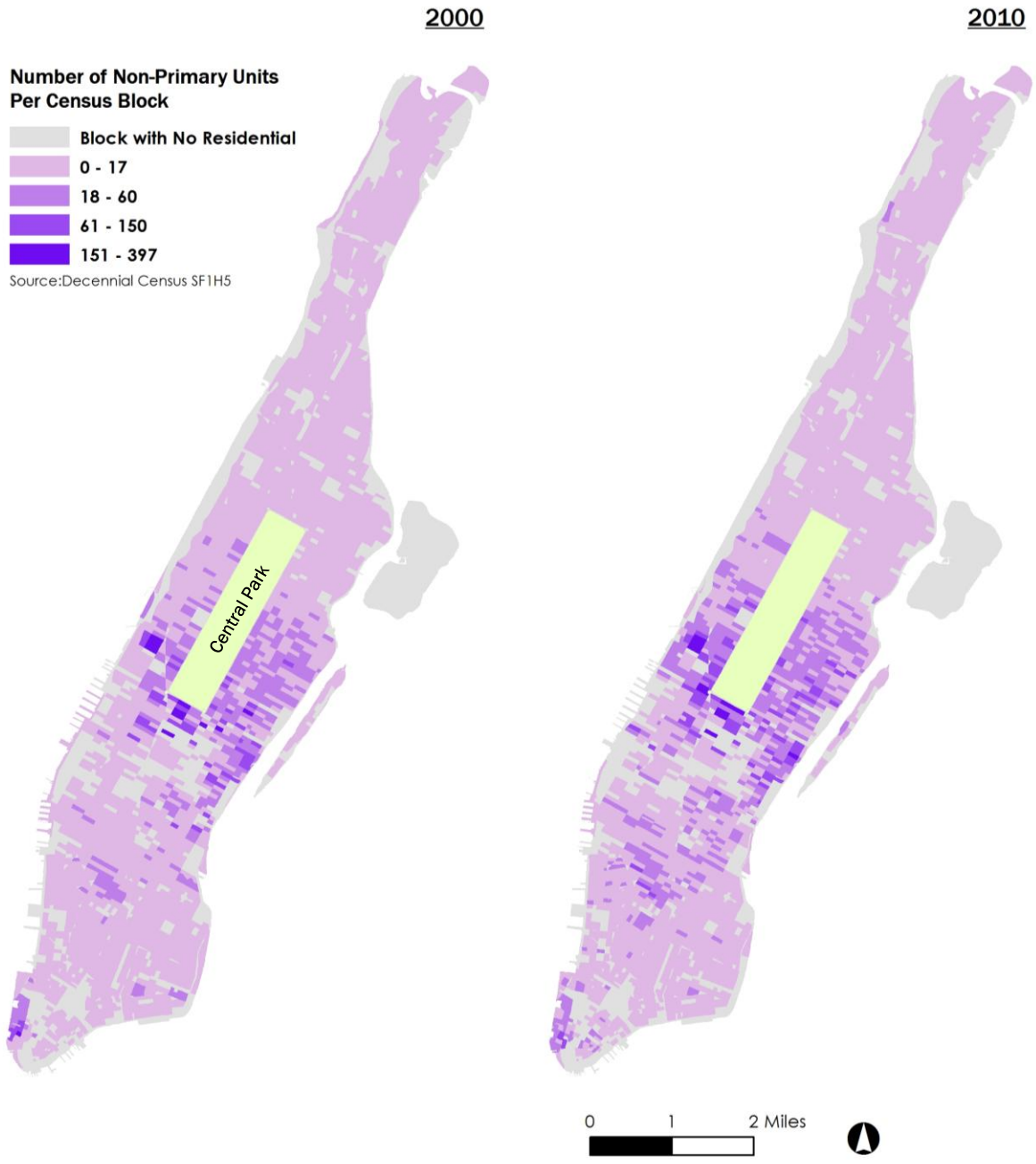
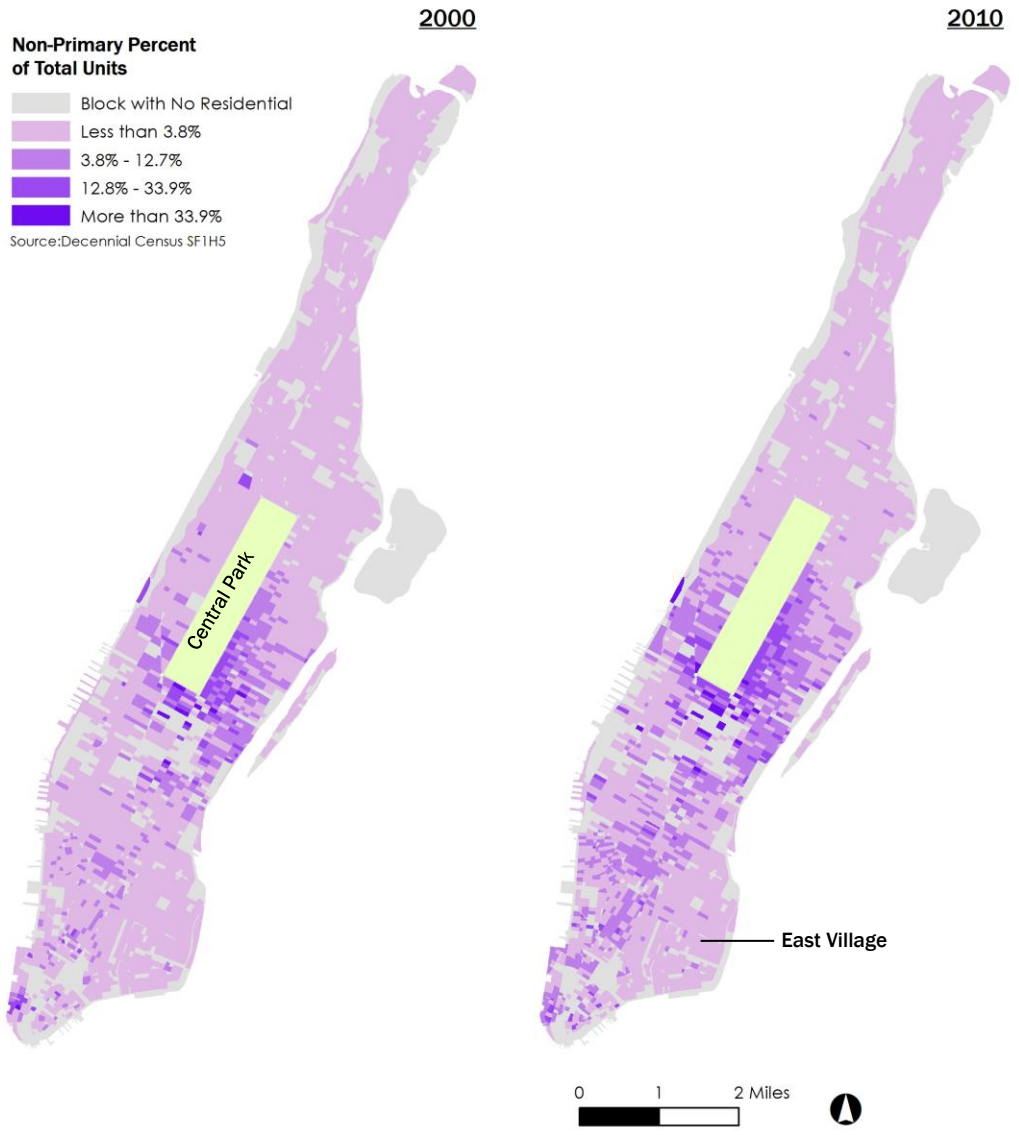
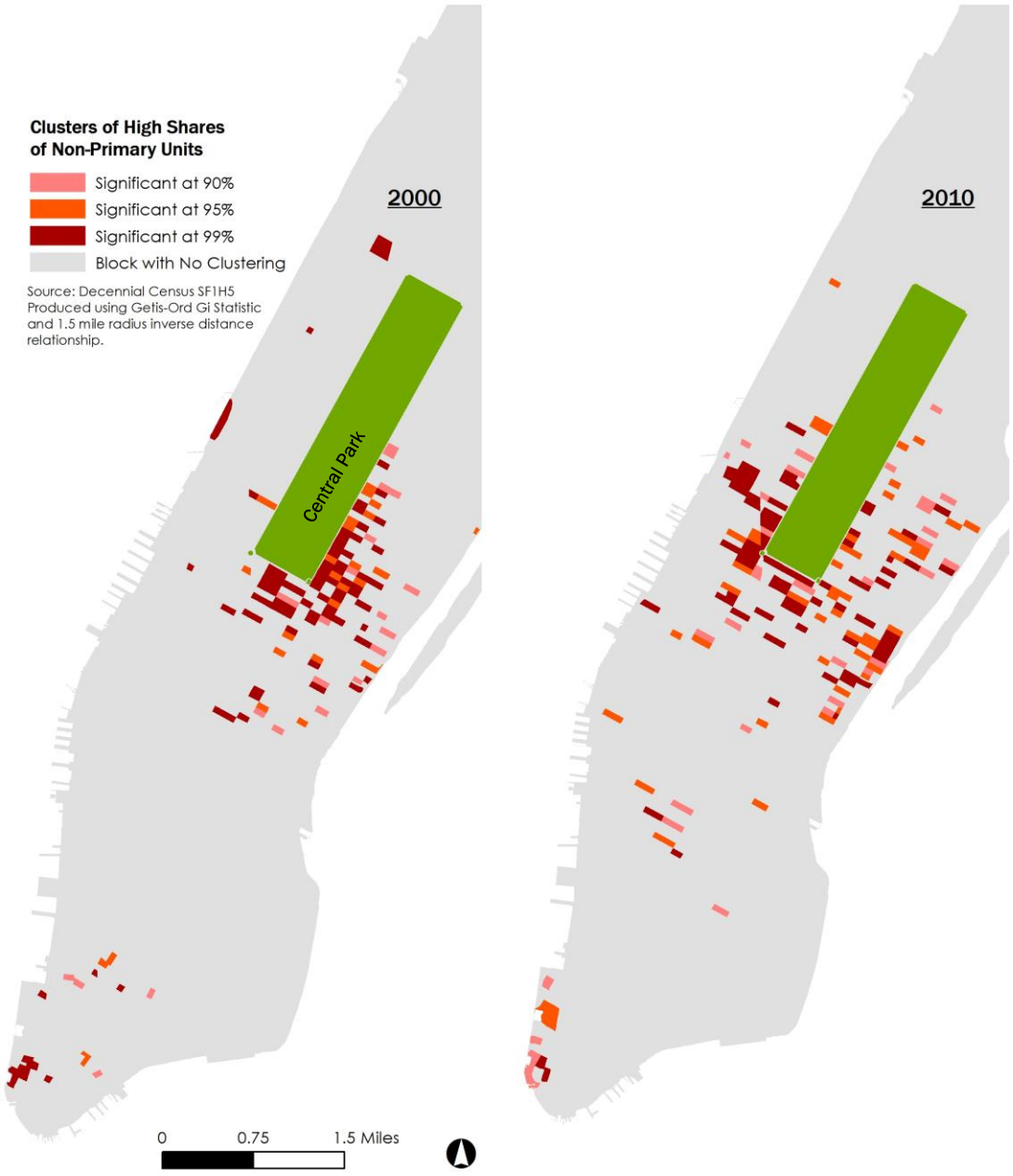


Figure 3: Share of Units that are Non-Primary (Non-Primary/Total) Per Census Block



Some blocks in these areas also show newly formed small clusters by 2010 (see Figure 4). Additionally, very significant high share clusters of non-primary census blocks appear in 2010 around Lincoln Center as well as the area adjacent to the East River near the United Nations complex. Most of the clusters are significant at a 95% level of confidence.

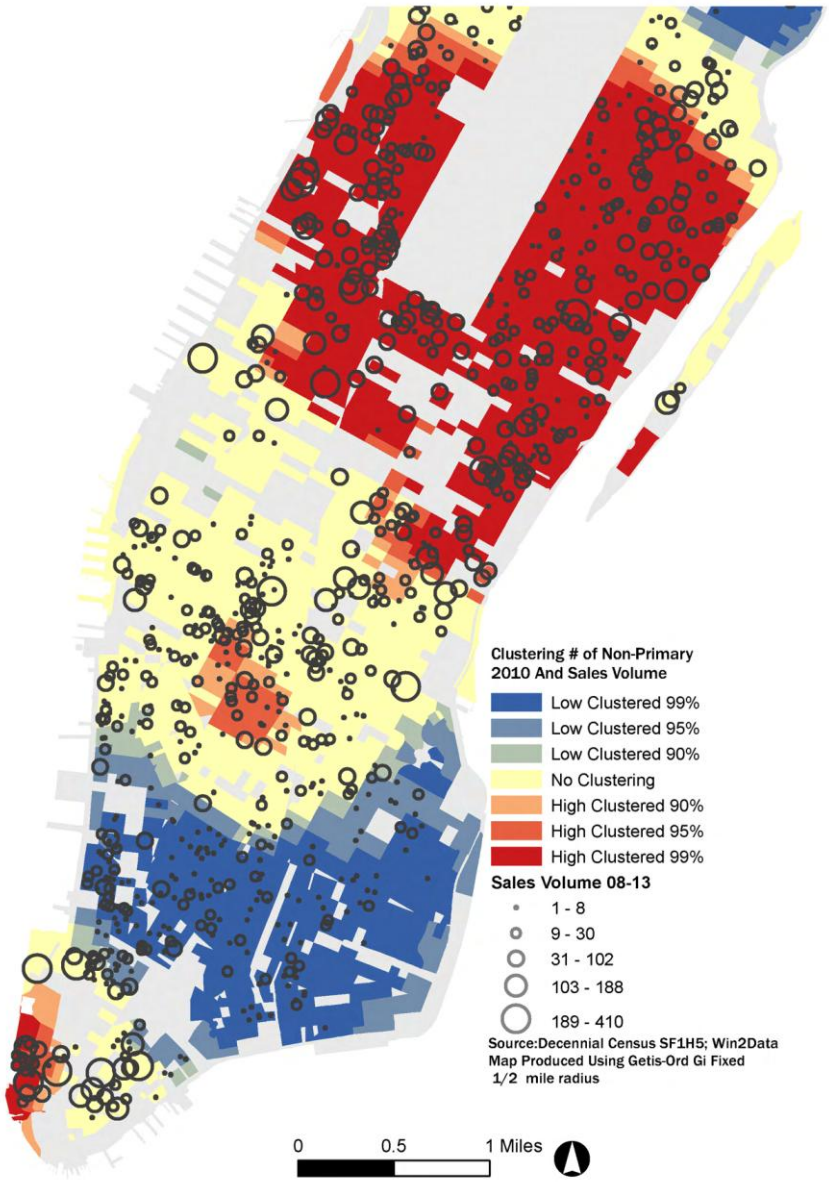
Figure 4: Clustering of Census Block with High Shares of Non-Primary Units



A similar pattern is shown in the clustering of the raw number of non-primary units using a slightly less stringent fixed distance parameter for calculating neighbors (see Figure 5). It should be noted that using the raw number of non-primary units also results in a large section of low-value clusters in some areas with less total housing units but a high share of non-primary units over total units (e.g. Greenwich Village). In Figure 5, the number of sales

transactions per building between 2008 and 2012, symbolized by proportional rings, are superimposed on the clusters of non-primary units per block. A large number of buildings with high sales volume spatially coincide with clusters of non-primary housing. These figures provide clues as to which neighborhoods might potentially be affected the most by the growth in non-primary housing. The spatial patterns also begin to hint at locational preferences of non-primary buyers and their possible effects on the overall housing market.

Figure 5: Volume of Sales Transactions per Condo Tax Lots and Clustering of Raw Non-Primary Units



Condominium Sales Transactions

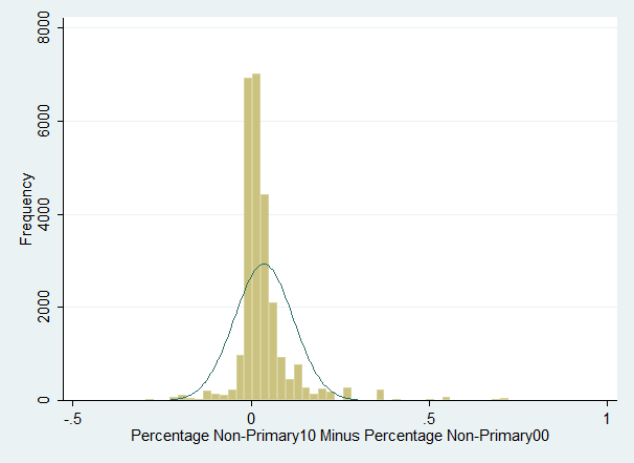
The dependent variable within the regression analysis is the price per square foot of the sales transactions symbolized in Figure 5. The average price of these sales was $1,304 PSF (price per square foot). These numbers are slightly higher than the condo sales figures published by Prudential Elliman real estate firm in their annual reports (Miller 2013, 11). The distribution of the price per square foot was not normally distributed and highly skewed due to many extremely expensive sales transactions such as penthouses on Central Park or duplex loft apartments in Tribeca. While this might partially be due to errors, the variance and skewness are so high that the data was log-transformed to make it more compact, resembling a more normal distribution. The explanatory variable of interest, change in share of non-primary house per census block, also demonstrates rightward skewness and a very high peak near zero since most census blocks did not experience drastic increases or decreases in the share of non-primary units.

Table 5: Price per Square Foot and Change in Share of Non-Primary Summary Statistics

Statistic	PSF ($)	Difference Share Non-Primary
Number of observations	26121	26121
Mean	1303.52	3.58
S.D.	909.36	8.23
Min	100.89	-29.6
25%	918.52	0.2
Median	1138	1.8
75%	1410.42	4.5
Max	13048.64	72.3
Variance	826933.5	67.67188
Skewness	5.738748	3.25765
Kurtosis	52.20763	22.75718

Source: CoreLogic

Figure 6: Distribution of Change in Share of Non-Primary



The high variation in price per square foot across geographies is also demonstrated by cross-tabulating neighborhoods and mean PSF as shown in Table 6.

Table 6: Transaction PSF and Observations by Neighborhood

Neighborhood	Code	Frequency	Percent	Mean	Std. Deviation
Battery Park City-Lower Manhattan	1	3073	11.76	1079.0103	734.41792
Central Harlem North-Polo Grounds	2	322	1.23	567.60848	380.46582
Central Harlem South	3	914	3.50	616.13659	201.58887
Chinatown	4	186	0.71	966.79044	225.2387
Clinton	5	1786	6.84	1233.6333	644.76205
East Harlem North	6	320	1.23	685.90763	267.48215
East Harlem South	7	234	0.90	885.49128	379.30867
East Village	8	332	1.27	1278.7279	789.50779
Gramercy	9	531	2.03	1306.8505	361.99139
Hamilton Heights	10	134	0.51	403.26925	168.06475
Hudson Yards-Chelsea-Flatiron-Union Square	11	2461	9.42	1342.8673	502.81122
Lenox Hill-Roosevelt Island	12	1592	6.09	1228.3695	505.06588
Lincoln Square	13	2815	10.78	1703.7326	1337.7911
Lower East Side	14	113	0.43	991.5724	411.3072
Manhattanville	15	6	0.02	521.209	75.151671
Marble Hill-Inwood	16	23	0.09	413.87355	158.44421
Midtown-Midtown South	17	1764	6.75	1665.9703	1084.1905
Morningside Heights	18	190	0.73	883.98598	325.77984
Murray Hill-Kips Bay	19	968	3.71	1056.4557	235.54534
SoHo-TriBeCa-Civic Center-Little	20	1590	6.09	1449.0615	626.26605
Turtle Bay-East Midtown	21	1617	6.19	1202.6664	664.36465
Upper East Side-Carnegie Hill	22	986	3.77	1801.5211	1153.1916
Upper West Side	23	1950	7.47	1430.1125	1496.7852
Washington Heights North	24	42	0.16	461.21897	142.52458
Washington Heights South	25	125	0.48	416.08511	97.887513
West Village	26	841	3.22	1714.4898	894.10738
Yorkville	27	1206	4.62	1134.2353	532.30192
Total		26121	100.00	1303.5241	909.35883

Source: Win2Data; NYC DCP

The spatial distribution of transactions is heavily concentrated in neighborhoods below 96th Street. This is partially due to the much higher concentration of condominiums and sales volume below 96th Street. Other notable observations are the lower number of prewar condominium transactions and their corresponding lower price. In New York City, market-rate, new residential construction within the past fifteen years accounts for more than one third of all condominiums buildings. It should also be noted that between 2008 to 2012, the market was relatively stable. While the market was still near its peak in early 2008, prices and volumes fell later that year when the market headed into a post-recession slow-growth period relative to previous years (Miller 2013). For summaries and tabulations of other variables used within regression, see Appendix B.

Regression Analysis

The final regression utilized indicates that the difference in the share of non-primary apartments does explain for some of the variation in the price per square foot of a transaction.

The model as a whole was statistically significant and explained about 41% of the variation in price per building:

Table 7: Significance and Variation Accounted for by Regression Model

	Sum of Squares	Degrees of Freedom	Mean Squares	Number of observations	25637
				F(47, 25589)	373.94
Model	2260.39177	47	48.0934419	**Prob > F**	0
Residual	3291.04334	25589	0.128611643	**R-squared**	0.4072
				Adj R-squared	0.4061
Total	5551.43511	25636	0.216548413	**Root MSE**	0.35862

All coefficient values were statistically significant at a 95% confidence level with the exception of the neighborhood dummy variables for Morningside Heights, Lower East Side, and Chinatown as well as for the year dummy variable of 2012. Below are the coefficients with the variable of interest, difference in non-primary share, highlighted. Standardized beta values are also provided for comparing among some variables.

Table 8: Regression Coefficients

Variable	Coefficient	Standard Error	T-Stat	P>|t|	Beta (Standardized Coefficient)
Square Feet	0.0001442	3.31E-06	43.6	0	0.2285816
Post-War	0.0741332	0.0076739	9.66	0	0.0739708
New Construction	0.1116427	0.0078729	14.18	0	0.118768
2009	-0.0811437	0.0070584	-11.5	0	-0.0648345
2010	-0.059118	0.00668	-8.85	0	-0.0506402
2011	-0.0195742	0.0067692	-2.89	0.004	-0.016468
2012	0.0104008	0.007101	1.46	0.143	0.0082946
Quarter 2	-0.0204615	0.0063465	-3.22	0.001	-0.0197545
Quarter 3	-0.0312777	0.00634	-4.93	0	-0.030316
Quarter 4	-0.0278313	0.0068886	-4.04	0	-0.0242742
Mid-Rise	-0.0375533	0.0117026	-3.21	0.001	-0.0354828
High-Rise	0.0592978	0.0125895	4.71	0	0.0597678
Altered	0.0702057	0.0069667	10.08	0	0.0625802
Historic	0.1196226	0.0093623	12.78	0	0.0730284
Elevator	0.0471068	0.0236551	1.99	0.046	0.0107056
Mixed-Use	0.0817485	0.0072275	11.31	0	0.0632841
Storage	-0.0401275	0.0071714	-5.6	0	-0.0299315
Difference in Non-Primary Share	0.005058	0.0003058	16.54	0	0.0899186
%Latino	-0.0009249	0.0003767	-2.46	0.014	-0.019524
%Black	-0.0009009	0.0004425	-2.04	0.042	-0.0263289
%Owner Occupied	-0.0006914	0.0001291	-5.35	0	-0.0311095
Yorkville	0.0786762	0.012911	6.09	0	0.0357974

Variable	Coefficient	Standard Error	T-Stat	P>|t|	Beta (Standardized Coefficient)
West Village	0.442054	0.0149099	29.65	0	0.1692107
Washington Heights South	-0.6992188	0.0388471	-18	0	-0.1046656
Washington Heights North	-0.6742808	0.0562543	-11.99	0	-0.0586012
Upper West Side	0.1599407	0.0114446	13.98	0	0.0889805
Upper East Side-Carnegie Hill	0.3967045	0.013773	28.8	0	0.1639407
Turtle Bay-East Midtown	0.1372677	0.0116793	11.75	0	0.071709
SoHo-TriBeCa-Civic Center-Little	0.2399898	0.012649	18.97	0	0.1220229
Murray Hill-Kips Bay	0.092221	0.0138139	6.68	0	0.0377752
Morningside Heights	-0.0084819	0.0279291	-0.3	0.761	-0.0015633
Midtown-Midtown South	0.3337185	0.0114532	29.14	0	0.1779072
Marble Hill-Inwood	-0.9282762	0.0969428	-9.58	0	-0.0482384
Manhattanville	-0.4364319	0.149135	-2.93	0.003	-0.0143463
Lower East Side	0.0599965	0.0355849	1.69	0.092	0.0085409
Lincoln Square	0.3165508	0.010097	31.35	0	0.2117811
Lenox Hill-Roosevelt Island	0.1304221	0.0118492	11.01	0	0.0676393
Hudson Yards-Chelsea-Flatiron-UniSq.	0.2759326	0.010726	25.73	0	0.1740433
Hamilton Heights	-0.7361369	0.0371102	-19.84	0	-0.1140697
Gramercy	0.2591005	0.0175106	14.8	0	0.0785645
East Village	0.2646525	0.0227471	11.63	0	0.060554
East Harlem South	-0.1031749	0.0275739	-3.74	0	-0.0210857
East Harlem North	-0.3237164	0.0253363	-12.78	0	-0.0736936
Clinton	0.2063217	0.0117527	17.56	0	0.1128763
Chinatown	0.0144201	0.028925	0.5	0.618	0.0025003
Central Harlem South	-0.3859711	0.026158	-14.76	0	-0.153795
Central Harlem North-Polo Grounds	-0.4569704	0.0355172	-12.87	0	-0.1064723
Constant	6.555558	0.0255537	256.54	0	

Since the dependent variable was log-transformed, the coefficients for each variable represent the expected percent change in PSF for each corresponding variable. For example, a .0051 coefficient is multiplied by 100 to compute a 0.51% increase in PSF. In other words, for the sale of an apartment located within a census block whose difference in non-primary share increased by 1 (percent) between 2000 and 2010, the effect is an increase of 0.51% in PSF.

While this at first might seem negligible, consider a hypothetical transaction of an apartment sold at the median price of $1,138 PSF and located within a census block whose share of non-primary apartments increased by five percent in the last ten years. Comparing this apartment to

an apartment in a census block where the share of non-primary units remained the same, holding all else equal, the predicted price difference would be nearly forty dollars PSF.[9] If that apartment is one thousand square feet in area, then this increase of nearly forty dollars PSF will be equal to roughly $39,000 dollars, or approximately four percent of the apartment's total price.

It should be noted that neighborhood dummy variables have the highest and lowest coefficient values. The high absolute value of the coefficients demonstrates the importance of neighborhood and adjacency effects, especially in urban areas (Can 1990). Overall, the results demonstrate that holding all other variables constant, price per square foot is higher for apartments within census blocks that experienced an increase in the share of non-primary apartments between 2000 and 2010.

Discussion

The findings in the study provide insight into where and to what extent the market for non-primary homes has grown and whether a connection can be made between the growth in non-primary housing demand and housing prices. They serve as a launching point for further policy discussion by providing numbers, maps, and statistical analysis to describe an issue that has not received much attention outside of popular media. Shifting towards the policy realm, a better understanding of the structural forces and individual preferences driving these changes need to be considered more in-depth.

Based on interviews conducted and documents reviewed, this section uses a "push-pull" dichotomy to provide an analytical structure to examine these forces.[10] Overall, financial and economic considerations are important to non-primary homebuyers. Nonetheless, many decide to buy non-primary homes in New York City based on personal motivations, aspirations, and

[9] This calculation used resembles a compound interest rate equation where the resulting PSF be equal to psf_{orig}(1+ coefficient)^(variable units increased).
[10] This push-pull framework has often been used within empirical analysis of migration, both economic and demographic (Molho 1986; Dorigo and Tobler 1983).

preferences that supersede financial considerations. Some of these factors are New York (destination) specific while others are universal.

Table 9: Push-Pull Factors for Non-Primary Homebuyers

PUSH	PULL
Lack of services (e.g. education, health, etc.)	Services
Political instability	Financial stability of local RE market
Rise in wealth globally	Liquidity (sell and rent)
Monetary instability	Scarcity of land
High real estate prices at home	Personal aspirations (i.e. cultural capital)
Conspicuousness	Lifestyle
Lack of safety	Diversity/anonymity

Push

The global rise of a wealthy elite has become one of the most conspicuous and noticeable drivers of the urban non-primary housing phenomenon. As the National Association of Realtors (2012) has pointed out, buyers from Russia, Brazil, and China account for an increasing share of residential real estate purchases in the United States. As previously mentioned, this has been extensively profiled in newspaper articles. Knight Frank Global Property Consulting's recent publication, the 2013 "The Global Wealth Report," provides a look into the investment and financial management preferences of high net worth individuals (HNWIs), super-rich people holding more than thirty million US dollars' worth of assets according to the report. From 2011 to 2012 alone, the percentage of HNWIs increased by 4.8% from approximately 181,000 people to 190,000 people. The increase is most pronounced in countries outside of Europe and North America with HNWIs in India, China, and Brazil already outnumbering their British, Italian, and French counterparts (ibid, pp. 9-13)

It is important to differentiate buyers from the global South and buyers from European, North American, and New York, because push factors are often origin specific. For example, super-rich families from the global South tend to purchase apartments in locations with established higher education institutions because of a perceived lack of higher education opportunities within their home countries. Furthermore, political and economic instability in these countries can push this increasingly global wealth into countries with more financial safeguards. For example, high inflation, sudden political shifts towards redistributive policies, and economic crisis has prompted many wealthy Latin Americans to transfer most of their wealth to dollar or

euro denominated investments in order to hedge against such domestic risks (Interview A -- Wealth Manager 2013).

On the financial side, origin country is also important in comparing the real estate prices relative to prices in New York City. One realtor specializing in international HNWIs mentioned price increases in other countries, such as Russia, India and Brazil, have made New York City relatively more affordable than in the past years.

Table 10: Most Expensive Cities for Prime Property (2012)

Rank	City	Range U$D PSF	Local Currency
1	Monaco	5350-5920	EUR 45,900/SQM
2	Hong Kong	4570-5050	HKD 37,320/SQFT
3	London	3890-4300	GBP 2,540/SQFT
4	Geneva	2720-3010	CHF 28,200/SQM
5	Paris	2350-2600	EUR 20,160/SQM
6	Singapore	2340-2580	SGD 3,100/SQFT
7	Moscow	2040-2260	RUB 702,700/SQM
8	New York	2030-2240	USD 2,140/SQFT
9	Sydney	2020-2230	AUD 22,000/SQM
10	Shanghai	1820-2020	RMB 130,500/SQM
11	Beijing	1530-1700	RMB 109,800/SQM
12	Rome	1470-1550	EUR 12,000/SQM
13	Miami	1300-1440	USD 1,370/SQFT
14	Tokyo	1240-1370	JPY 1,200,000/SQM
15	Los Angeles	1210-1340	USD 1,270/SQFT
16	Mumbai	990-1110	INR 57,800/SQFT
17	Istanbul	880-980	USD 10,000/SQM
18	Sao Paulo	660-730	BRL 15,390/SQM
19	Dubai	520-580	AED 2,000/SQFT
20	Cape Town	510-570	ZAR 49,500/SQM

Source: Knight Frank 2013

Pull

Pull factors can often be financial too, but the choice to buy a second home specifically in New York City is more often a personal choice. Financially, New York offers a relatively stable real estate market. The scarcity of vacant land in Manhattan means an inelastic supply of housing that provides some protection against downward fluctuations in price. Another factor that draws buyers to New York, and in particular to condominium units, is the relative ease to rent and sell properties. Caretaker services are often arranged for with realtors to manage carrying costs, repairs, and collect rent if needed (Interview B 2013). Some owners take advantage of

this flexibility; they rent the apartment for one period of time, use the apartment as a vacation home, or alternately let a family member stay long-term when needed. Many of these characteristics are not unique to New York City. Cities like London, Hong Kong, and Paris also share many of these same features. While proximity plays a role in choosing among such cities, decisions to own a second home in these cities is more subjective.

According to a global survey by Knight Frank (2013, 32), the number one factor for HNWIs in choosing the location of a second-home is lifestyle. The pull of lifestyle factors conforms to coastal and countryside locales that have traditionally been favored by second-home purchasers. However, the same survey indicates that these individuals are far more interested in purchasing city properties (ibid, 63). From interviews conducted, the pull factors of lifestyle that draws buyers to New York include personal comfort level with the city and personal aspirations. Buyers are drawn to museums, shops, and restaurants that generally attract so many tourists to New York annually.

Additionally, they are also drawn to the relative anonymity afforded to them and what some perceived as acceptance by locals that made them feel more comfortable in New York than in other cities. For many, this sentiment was strongly associated with the diversity and openness of the city's culture. On the other hand, these observations might be a direct consequence of locational choice; the empirical mapping analysis demonstrates that many of these non-primary purchases are in areas characterized largely by massive daily flows of commuters, tourists, business people, and other day-trippers. The spaces that characterize these areas, such as urban malls like the Time Warner Center, closely resemble and feel like many contemporary urban places in global cities.

Interviewees also mentioned the cultural cache of owning an apartment in the city. For foreign buyers from smaller countries and cities, having an apartment in New York City holds symbolic value. One interview subject from a small city in Brazil *rents* an apartment in NYC on a year-by-year basis. She cited a personal connection, characterized as "passion," to New York and revealed her personal aspiration to relocate full-time eventually (Interview D--non-primary renter 2013). For many of these highly mobile wealthy individuals, possessing second

homes is a form of consumption that Veblen and Bourdieu would argue "leads to a particular type of social differentiation, one based on 'symbolic capital'..." (Mullins 1991, 329). Possessing an apartment in New York City therefore fulfills a desire to be affiliated with a highly mobile, global cosmopolitan class and "belonging to the cities they visit as well as to the locations of their primary residence" (Hoffman, Fainstein, and Judd 2008, 243). These lifestyle considerations often guide locational decisions among cities and within cities themselves. In this sense, the choice between the "haute couture of Paris" versus the "edginess of New York" can be decisive, sometimes subconscious factors that hold symbolic value and are weighed among more practical factors such as proximity and money.

Implications

Many of the effects of non-primary housing can be equated with the effects urban tourism has had on city centers. Urban tourism has been associated with broader urban processes of gentrification and globalization that "pinpoint a change in the nature of consumption...tied to a new regime (or social structure) of capital accumulation, one associated with a new society, including a new form of urbanization" (Mullins 1991, 328). Non-primary housing, however, can be differentiated from urban tourism in that it observably affects the housing stock and the character of residential neighborhoods by potentially producing an aura of emptiness. The Census Bureau's designation of non-primary units as a type of vacancy illustrates this case in point. A large concentration of these units can also create new urban spaces different from tourism, transformations that are possibly more damaging to the socio-economic and urban fabric of New York City. Furthermore, if conceived as an iteration of gentrification, non-primary housing might perpetuate socio-spatial inequities by intensifying and accelerating the affordability crisis experienced by many New Yorkers.

Neighborhood Impacts

While the regression analysis looked at price effects of non-primary housing demand, the effects on neighborhood character, qualities and services, if any, are much harder to qualify. Firstly, neighborhoods are not transformed overnight. Changes are often gradual and difficult to discern as they occur. Secondly, it would be challenging to separate the growth in non-primary housing from other simultaneous processes such as demographic shifts, architectural and policy

interventions, and alternate causes of residential and/or commercial displacement. Lastly, Manhattan's high residential density and high non-residential flows of people might obscure increases in non-primary housing. Often, the impacts are felt at the building level. In buildings that contain many non-primary units, full-time residents might either lament a lack of community or alternatively, enjoy the additional privacy (Harris 2013).

In comparison to New York, the neighborhood impacts can be more noticeable in cities where large shares of non-primary housing are found in less residentially dense neighborhoods. Two examples, Belgravia, London, and Rehaviah, Jerusalem, have experienced an influx of foreign non-primary homebuyers that have caused prices to skyrocket while simultaneously creating street blocks that resemble ghost towns (Alfasi and Fenster 2009; Barrionuevo 2012b). Similar to the case of New York City, these neighborhoods are located near the center. However, Rehaviah and Belgravia are more isolated from the daily flows of tourists, businesspersons, and other activity that is found within high non-primary share areas of Manhattan. This disparity could partially be due to their respective urban form. Whereas Manhattan's streets are mostly continuous and orthogonal, Belgravia and Rehaviah are characterized by irregular street patterns and bounded by soft and hard barriers such as parks and railways (see Figure 6). These areas have historically been high-end residential neighborhoods that recently experienced a sharp increase in non-primary homes.

While neighborhoods changes can occur at the very visible level of the built-environment, social changes are often more difficult to initially discern. Gentrification in places like Harlem, for example, has given birth to a plethora of boutiques while displacing retail that low-income long-term residents relied upon (Zukin et al. 2009). However, non-primary housing does not necessarily mirror other forms of gentrification. "Absentee gentrification," as a Reuters article dubbed the non-primary phenomenon, might also lead to retail changes (Pullella 2011). However, such changes are more likely to occur because of a lack of sales volume, as opposed to new demand for cappuccinos and yoga classes. Small retailers such as dry cleaners and other specialized services rely on a critical mass of local residents since their business is dependent upon residents from within the immediate area. More importantly, long-time residents can feel isolated with many of the social ties that define neighborhoods disappearing rapidly. In

Jerusalem, Alfasi and Fenster (2009) point to the rupture in the social fabric of neighborhoods where new foreign owners are only present two to three weeks a year. Social ties and daily interactions with neighbors are an important aspect of formulating place-based identities and communities. Overall, the effects could theoretically become unsustainable if non-primary housing surpasses a threshold wherein neighborhoods, often in areas of high-value real estate, slowly lose not only a sense of community, but also the necessary infrastructure.

Figure 7: Areal and Street Images of Neighborhoods with High Shares of Non-Primary Housing

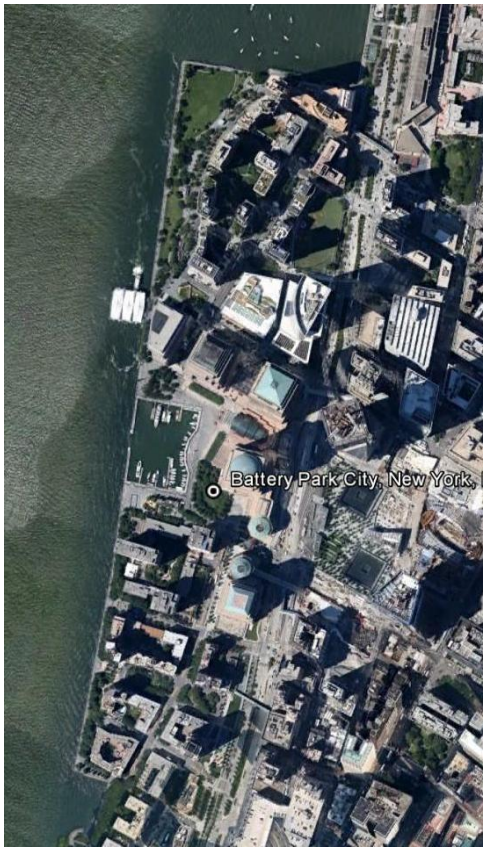
Belgravia, London
Source: Google Earth

Rehavia, Jerusalem
Source: Google Earth

Belgravia, London
Source: Google Images

Rehavia, Jerusalem
Source: Google Images

Figure 7: Areal and Street Images of Neighborhoods with High Shares of Non-Primary Housing



Battery Park City, NYC
Source: Google Earth

Battery Park City, NYC
Source: Google Images

Housing

The findings previously presented hypothesize the effects of non-primary housing demand on prices through a regression model. The broader implications for housing are more far-reaching. Policymakers, economists, and advocates of higher density claim that New York City's perpetual housing affordability crisis is due mainly to a housing shortage crisis. The growth in non-primary housing, however, complicates this logic. Advocating for the city to promote new residential construction would alleviate demand pressures if the New York City housing market operated in a bubble. Yet, like many other trends, the residential market in New York City is subject to interactions simultaneously occurring within and between multiple scales. In the next ten years, according to Knight Frank's "Global Wealth Report," the number of individuals with more than thirty million US dollars' worth of assets is projected to grow by ninety thousand worldwide (2013, 11). Additionally, these individuals are becoming increasingly interested in urban non-primary properties (ibid., 63).

Besides this simple increase in demand from wealthy non-residents, the liquidity crisis in the United States has limited the access to credit for homebuyers that cannot afford large down payments because of their earnings or their credit history. According to some interviewees, this has increased the market power of non-primary homebuyers who commonly provide all-cash deals. In turn, developers have increasingly catered their designs and marketing materials towards these buyers (Interview B 2013; Interview A 2013). The evidence lies in the end product of luxury condos exhibiting not only top-grade finishes, but also feng-shui floor plans, and elevators that jump from the 3rd to the 5th floor.[11]

The influence of these buyers suggests that even if one considers the luxury housing market to be entirely separate from the regular housing market, the willingness of non-primary homebuyers to pay a premium for apartments with certain added features, changes the cost calculus for developers. In the absence of such demand, some developers would switch to producing apartments whose costs more closely reflect the preferences and possibilities of primary homebuyers. In essence, advocating for and incentivizing any or all increases in supply of housing does not necessarily address affordability because the inelastic demand driving the market end product may not translate into more housing for current residents.

The City

These preferences and practices of non-primary homebuyers have created new geographies of unused apartments. Additionally, the non-primary homebuyers might in part be pricing out residents from Core Manhattan. The housing decisions of these wealthy individuals might seem trivial to housing advocates concerned with social equity. However, it is these young professionals who over the past twenty years have migrated en masse to northwestern Brooklyn, Harlem, and Long Island City as housing prices increased in upper-middle class neighborhoods of Manhattan. Middle class and lower-income residents from adjoining areas, many of who do not have access to rent regulation or other housing assistance, often end up disproportionately

[11] The number four in Mandarin is considered unlucky because it closely resembles the word for death.

bearing the high costs of this displacement chain reaction accelerated in part by the demand for non-primary housing.

This trajectory intensifies existing socio-spatial patterns of inequality and foments social divisions often characterizing gentrification. Areas with large minority populations have experienced various waves of gentrification transforming neighborhoods like Fort Greene, South Harlem, and Williamsburg. Newcomers buy single-occupancy room and multi-family townhomes often to be converted into single-family residences, effectively expanding the borders of "Brownstone Brooklyn." While some Manhattan "expats" are often motivated to move to peripheral areas because of price considerations, others primarily seek neighborhoods in areas where the effects of tourism's growth are less visible.

In addition to the consequences of gentrification, the growth in non-primary housing leads to concerns of a growing spatial mismatch between infrastructure and year-round populations. As non-primary residents displace primary residents, hard infrastructure stays in areas that were previously populated by year-round residents. Transportation access, for example, is greatest in Manhattan, but many neighborhoods in Manhattan are losing year-round population to the outer boroughs where public transportation is not as abundant. Infrastructure like schools, subway stations, and other hard infrastructure are not moveable and are therefore at risk of being underutilized while growing demand in peripheral areas places pressure on local infrastructure.

Recommendations

The dominant housing policy framework employed by recent administrations in New York City has been to incentivize supply while trying to maintain current levels of regulated and subsidized units (City of New York 2003). The supply side policy, as exemplified by zoning bonuses, tax abatements and a developer-friendly agenda, does not adequately consider the challenges presented by non-primary housing demand. This additional demand poses new challenges for many residential neighborhoods that draw non-primary homebuyers. While the city has trumpeted the economic benefits of tourism, the intermediary nature of non-primary

units provides neither year-round housing for residents, nor year-round lodging for tourists. Instead, non-primary housing creates underused units that further contribute to high housing prices and that could potentially damage the social fabric of many neighborhoods.

To address these concerns, policymakers should consider the factors causing an increase in non-primary housing and use this knowledge to create more effective housing policy. Three general but practical measures listed below should be considered:

- Incentivize other forms of long-stay residences, condo-hotel, time-shares and other goods that might serve as potential substitutes for prospective buyers evaluating whether to purchase a non-primary home. Potential actions to consider might include loosening zoning regulations in East Midtown and the Fashion District.
- Decrease the willingness to pay of non-primary homeowners through tax policy or other financial disincentives. This can be done through property transaction fees commonly levied on foreign nationals purchasing real estate outside the United States. Small fees and taxes might not deter some buyers, but the city's residents would at least be compensated for what can be considered a negative externality.
- More broadly, incorporate knowledge of non-primary housing trends into the design of supply incentives. This could include incentivizing more outer borough development. Additionally, certain bonuses and incentives could be made contingent upon the units being used year-round, either by renters or the owners. Lastly, certain amenities that cater towards non-primary homebuyers could be incorporated into a criterion for granting density bonuses and tax abatements.

This study provides a launching point for further discussion on the role of non-primary housing in planning by using a variety of methods to describe the phenomenon, and by examining some of the factors and implications of non-primary housing in global cities. The analysis herein demonstrates that the rise of non-primary homes poses both practical and theoretical challenges to urban planning. These challenges necessitate further cross-disciplinary research into a nascent topic. Case studies and comparative studies, for example, can provide new insights as to how legal, cultural, and political context alter non-primary housing's influence on the web of

physical and social relationships characterizing the built-environment. Most importantly, research should also engage public discourse in order to effectuate changes in housing policy.

From a broader perspective, the rise of non-primary housing ultimately forces us to think about the meaning of place and community in global cities. In an era of increasing wealth and mobility, it weighs heavily upon those concerned with quality of life, mobility, and social justice issues. Expanding empirical analysis and developing a stronger theoretical framework can motivate policymakers and stakeholders to engage the issue more directly. Along the way, members from local communities can become more readily engaged in shaping the future of their respective neighborhoods and the city-at-large through democratic planning processes that give voice to local residents.

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Appendix A: Sample Interview Questions

Homebuyer

1) Where is your primary residence?
2) Do you own any other residential property outside of New York? Where and how many?
3) What factors were most important to you in deciding whether to purchase a second home?
4) What features or characteristics guided choosing this specific apartment (location? Doorman? Size? Common Charges?)
5) What are the primary uses of the apartment (work related, vacations, etc…)?
6) How often do you use this apartment (per week/per year)?

Finance Professional

1) What financial considerations do you advise your client to take before deciding whether to purchase a second home?
2) Is financing generally available to second homebuyers? What about foreign nationals?
3) What are the tax implications for claiming primary or non-primary residency in New York City?
4) Has interest in purchasing second homes increased in the past 3-5 years?

Real Estate Broker

1) How many non-primary clients do you handle per year? What percentage of your total clientele?
2) Where are your clients from?
3) How is the non-primary clientele different from those looking to purchase a second home?
4) Does non-primary demand shape new development or do developers see primary and non-primary residences as one in the same?

Government Official

1) Are second home residents different from tourists for economic development? Are they seen as having a net positive effect?
2) To what extent are politicians and government officials cognizant of the trends in non-primary homes?
3) Have there been any new policies considered that might affect non-primary homebuyers?
4) How does the phenomenon affect demand for certain types of neighborhood infrastructure?

Appendix B: Complete Summary Statistics of Variables Used in Regression Analysis

Sources: CoreLogic, Census Bureau, and NYC DCP

Dependent and Explanatory Variable of Interest

Statistic	Price SF	Diff in Share Non-Primary
no. obs.	26121	26121
Mean	1303.52	3.58
S.D.	909.36	8.23
Min	100.89	-29.6
25%	918.52	0.2
Median	1138	1.8
75%	1410.42	4.5
Max	13048.64	72.3
Variance	826933.5	67.67188
Skewness	5.738748	3.25765
Kurtosis	52.20763	22.75718

Date Sold

Quarter Sold	Frequency	Percent	Mean PSF	Std. Deviation
1	5927	22.69	1352.8484	1023.7455
2	7344	28.12	1316.248	876.26155
3	7413	28.38	1270.514	887.42823
4	5437	20.81	1277.5748	845.49746
Total	26121	100	1303.5241	909.35883

Year Sold	Frequency	Percent	Mean PSF	Std. Deviation
2008	7304	134.34	1311.8397	759.66255
2009	4323	79.51	1275.7939	929.59985
2010	5135	94.45	1276.4128	1035.9775
2011	4981	91.61	1312.3827	933.14374
2012	4378	80.52	1338.7529	930.56784
Total	26121	480.43	1303.5241	909.35883

Building Age

Era Built	Frequency	Percent	Mean PSF	Std. Deviation
Pre-1945	6591	25.63	1303.3679	1095.74
1945-1998	8103	31.52	1275.4919	955.86
Post-1998	11017	42.85	1314.2789	677.78
Total	25711	100.00	1299.2579	890.38

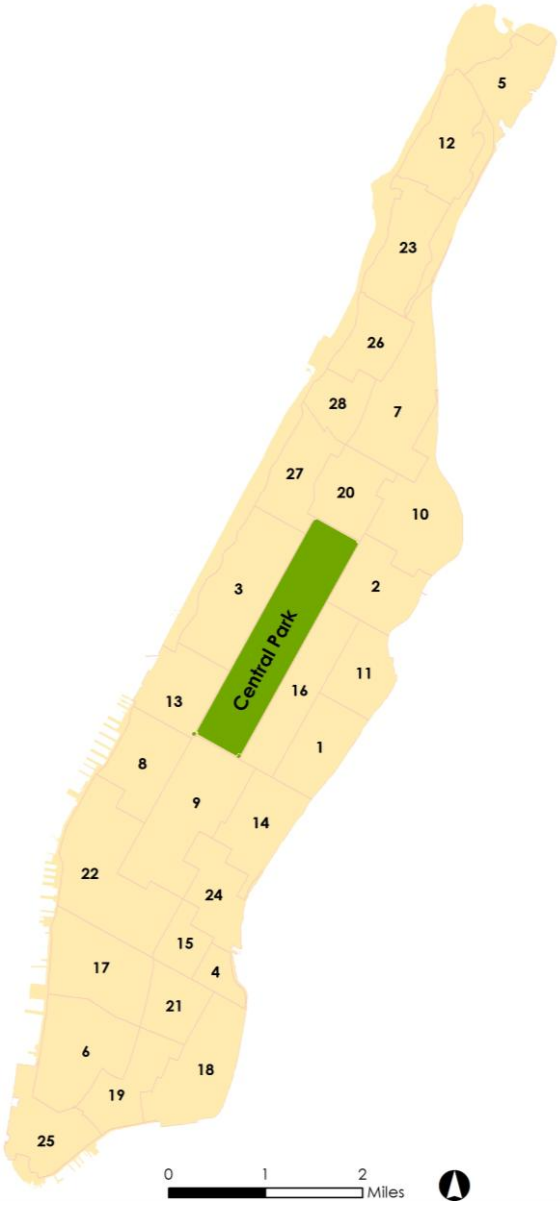
Binary Variables

Variable	Percent
Building Class (Elevator)	99
Mixed Use	84
Storage	14
Alteration (building)	22
Historic District	9

Other Continuous Variables

Variable	No. Observations	Mean	S.D.	Min	25%	Median	75%	Max
Price SF	26121	1303.52	909.36	100.89	918.52	1138	1410.42	13048.64
Diff in Share Non-Primary	26121	3.58	8.23	-29.6	0.2	1.8	4.5	72.3
Size (SQFT)	26121	1202.38	742.97	207	714	1014	1442	11861
Stories	26121	24.33	14.69	3	12	20	34	78
Year Built	25711	1974.32	36.72	1836	1940	1987	2006	2011
%Latino	26047	9.48	9.9	0	5	6.6	8.9	87.2
%Black	26047	7.42	13.6	0	1.7	3.3	5.3	87
%Owner Occupied	26047	39.26	21.04	0	22	39.4	54.3	100

Appendix C: New York Department of City Planning Neighborhood Tabulation Areas



	Neighborhoods
1	Lenox Hill
2	East Harlem North
3	Upper West Side
4	Stuyvesant Town
5	Inwood
6	Tribeca – Soho
7	Central Harlem North
8	Hell's Kitchen
9	Midtown
10	East Harlem North
11	Yorkville
12	Washington Heights North
13	Lincoln Square
14	East Midtown
15	Grammercy
16	Upper East Side
17	West Village
18	Lower East Side
19	Chinatown
20	Central Harlem South
21	East Village
22	Chelsea – Flatiron
23	Wash Heights South
24	Murray Hill
25	Financial District
26	Hamilton Heights
27	Morningside Heights
28	Manhattanville